Volunteer Lake Assessment Program Individual Lake Reports

RUST POND, WOLFEBORO, NH

MORPHOMETRIC DATA

Watershed Area (Ac.):	1,651	**Max. Depth (m):**	12.2	**Flushing Rate (yr^{1})**	0.6
Surface Area (Ac.):	210	**Mean Depth (m):**	7.4	**P Retention Coef:**	0.68
Shore Length (m):	4,800	**Volume (m^{3}):**	6,310,500	**Elevation (ft):**	579

TROPHIC CLASSIFICATION

Year	Trophic class
1981	MESOTROPHIC
2000	OLIGOTROPHIC

KNOWN EXOTIC SPECIES

The Waterbody Report Card tables are generated from the 2012 305(b) report on the status of N.H. waters, and are based on data collected from 2001-2011.

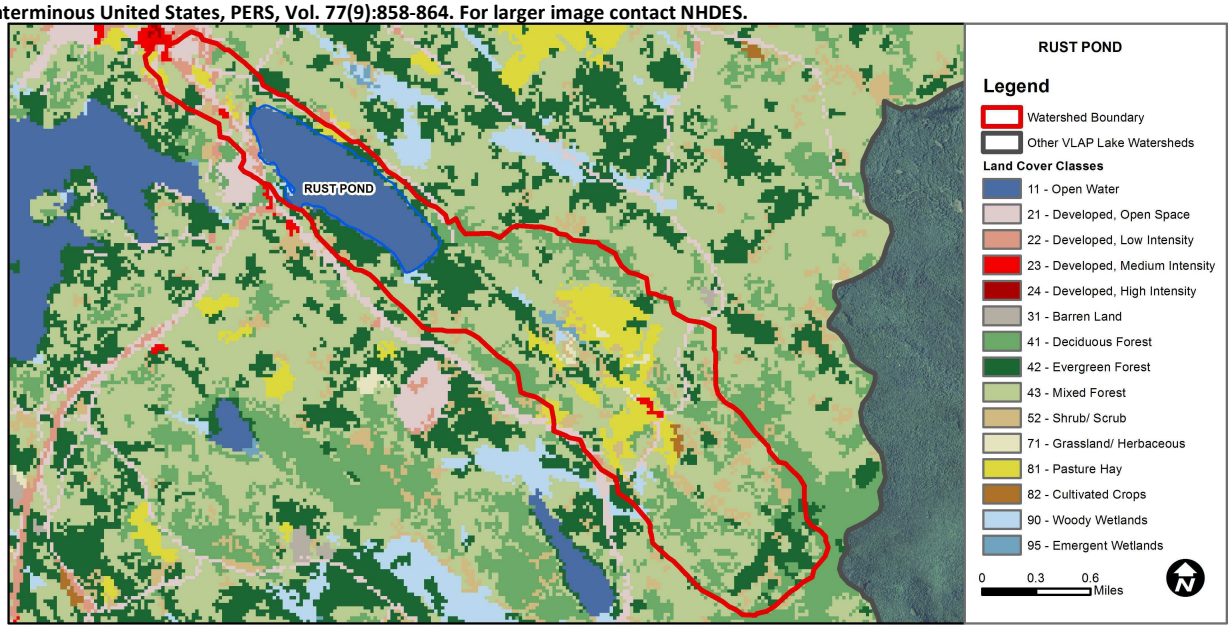
Designated Use	Parameter	Category	Comments
Aquatic Life	Phosphorus (Total)	Good	>/=5 samples and median is < threshold but > 1/2 threshold value.
	pH	Slightly Bad	>10% of samples exceed criteria by a small margin (minimum of 2 exceedances).
	D.O. (mg/L)	Very Good	At least 10 samples with 0 exceedances of criteria.
	D.O. (% sat)	Encouraging	< 10 samples and no exceedance of criteria. More data needed.
	Chlorophyll-a	Good	>/=5 samples and median is < threshold but > 1/2 threshold value.
Primary Contact Recreation	E. coli	Good	Geometric means < criteria; however at least 1 exceedance of the single sample criteria occurred.
	Chlorophyll-a	Very Good	At least 10 samples with 0 exceedances of criteria.

BEACH PRIMARY CONTACT ASSESSMENT STATUS

RUST POND - WOLFEBORO CAMP SCHOOL BEACH	E. coli	Very Good	All bacteria samples <75% of geometric mean criteria, but not enough to calculate geometric mean. Or, all bacteria samples are < single sample criteria and calculated Geometric means are less than geometric mean criteria.

WATERSHED LAND USE SUMMARY

Fry, J., Xian, G., Jin, S., Dewitz, J., Homer, C., Yang, L., Barnes, C., Herold, N., and Wickham, J., 2011. Completion of the 2006 National Land Cover Database for the Conterminous United States, PERS, Vol. 77(9):858-864. For larger image contact NHDES.

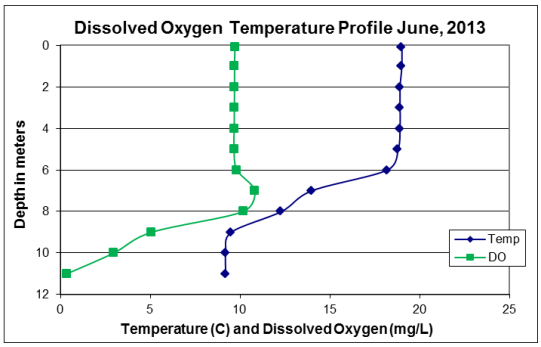


Land Cover Category	% Cover	Land Cover Category	% Cover	Land Cover Category	% Cover
Open Water	12.4	Barren Land	0	Grassland/Herbaceous	0.5
Developed-Open Space	3.73	Deciduous Forest	15.42	Pasture Hay	9.68
Developed-Low Intensity	1.45	Evergreen Forest	14.69	Cultivated Crops	0.24
Developed-Medium Intensity	0.48	Mixed Forest	34.07	Woody Wetlands	0.99
Developed-High Intensity	0	Shrub-Scrub	6.04	Emergent Wetlands	0.38

VOLUNTEER LAKE ASSESSMENT PROGRAM INDIVIDUAL LAKE REPORTS
RUST POND, WOLFEBORO, NH
2013 DATA SUMMARY

OBSERVATIONS AND RECOMMENDATIONS (*Refer to Table 1 and Historical Deep Spot Data Graphics)*

- **CHLOROPHYLL-A:** Chlorophyll levels were average in June and July and decreased to low levels in August. Average chlorophyll levels increased slightly from 2012 but were less than the state median. Historical trend analysis indicates stable chlorophyll with low variability between years.
- **CONDUCTIVITY/CHLORIDE:** Deep spot and tributary conductivity levels were slightly greater than the state median. Epilimnetic and Perry Brook chloride levels were low; however North Inlet chloride levels were slightly elevated. Historical trend analysis indicates significantly increasing (worsening) epilimnetic conductivity since monitoring began.
- **TOTAL PHOSPHORUS:** Deep spot phosphorus levels were low on each sampling event and historical trend analysis indicates significantly decreasing (improving) epilimnetic phosphorus since monitoring began. We hope to see this continue! Boulder Brook phosphorus levels were elevated in June following significant storm event of over 1.0 inch of rainfall prior to sampling. North End Inlet phosphorus levels were low in June following significant storm event and high flow which is good, and phosphorus levels increased in July and August as tributary flows decreased.
- **TRANSPARENCY:** Transparency was good and better than the state median. Transparency measured with the viewscope was generally much better than measured without and likely a more accurate representation of pond transparency. However, historical trend analysis indicates significantly decreasing (worsening) transparency since monitoring began.
- **TURBIDITY:** Deep spot turbidity was low on each sampling event. Boulder Brook turbidity was elevated in June and July. A significant storm event occurred in June potentially contributing to elevated turbidity; however July turbidity was also elevated following dry conditions. Unsure if low flows and sediment or erosion from storm events was the cause. North End Inlet turbidity was slightly elevated in August during low flow.
- **PH:** Deep spot pH levels were sufficient to support aquatic life, however historically have been less than desirable range 6.5 – 8.0 units. Historical trend analysis indicates relatively stable epilimnetic pH with moderate variability between years.
- **RECOMMENDED ACTIONS:** Conduct bracket and stormwater sampling at Boulder Brook to identify potential areas of erosion in the sub-watershed. Contact the VLAP Coordinator for assistance. The increasing (worsening) epilimnetic conductivity is likely a result of winter road maintenance. Encourage local road agents to obtain a NH Voluntary Salt Applicator license through the UNH Technology Transfer Center's Green SnowPro certification. Keep up the great work!



NH Water Quality Standards: Numeric criteria for specific parameters. Results exceeding criteria are considered a water quality violation.
Chloride: < 230 mg/L (chronic)
E. coli: > 88 cts/100 mL – public beach
E. coli: > 406 cts/100 mL – surface waters
Turbidity: > 10 NTU above natural level
pH: 6.5-8.0 (unless naturally occurring)

NH Median Values: Median values for specific parameters generated from historic lake monitoring data.
Alkalinity: 4.9 mg/L
Chlorophyll-a: 4.58 mg/m^3
Conductivity: 40.0 uS/cm
Chloride: 4 mg/L
Total Phosphorus: 12 ug/L
Transparency: 3.2 m
pH: 6.6

Table 1. 2013 Average Water Quality Data for RUST POND

Station	Alk.	Chlor-a	Chloride	Cond.	Total P	Trans.		Turb.	pH
	mg/l	ug/l	mg/l	uS/cm	ug/l	m		ntu	
						NVS	VS		
Boulder Brook				66.2	51			22.05	6.87
Epilimnion	12.8	3.14	10	67.7	5	4.97	5.87	0.56	7.24
Metalimnion				68.0	7			0.57	7.13
Hypolimnion				67.3	11			0.98	6.79
North End Inlet			33	66.2	27			2.14	7.06
Outlet				68.4	4			0.39	7.25
Perry Brook			3	58.0	12			1.22	6.89

HISTORICAL WATER QUALITY TREND ANALYSIS

Parameter	Trend	Explanation	Parameter	Trend	Explanation
pH	Stable	Trend not significantly data moderately variable.	Chlorophyll-a	Stable	Trend not significant; data show low variability.
Conductivity	Degrading	Data significantly increasing.	Transparency	Degrading	Data significantly decreasing.
			Phosphorus (epilimnion)	Improving	Data significantly decreasing.